FOREST INSECT CONDITIONS ON THE BOISE N.F. 1972

Information contained herein was compiled from aerial detection survey data, biological evaluations, and forest detection reports.

The Douglas fir beetle which has been epidemic since 1966 showed a leveling off in 1971 and a considerable decline in many areas in 1972. Mountain pine beetle continues to be a problem in ponderosa and lodgepole pine stands. Heaviest infestations still occur on state and private lands. Group fading of second growth ponderosa pine showed up in and adjacent to some logging areas caused by engraver beetles. Western budworm incidence and defoliation severity decreased markedly. The pine butterfly, which has been endemic since 1954, has increased even though defoliation was light and remained undetected during aerial surveys. The western tussock moth was down in intensity and acreage affected but still caused widespread defoliation of Ceanothus sp.

DOUGLAS FIR BEETLE - Dendroctonus pseudotsugae Hopk.

The Douglas fir beetle is a natural ecologic entity in Douglas fir forests. Unless fresh windthrow and storm debris is provided for beetle propagation (outside of "unsanitary" logging techniques), the beetle is usually unable to sustain standing tree attacks indefinitely. It will return to endemic levels when natural environmental factors occur in such combinations as to hold populations in check. Unfortunately, in overmature stands this seldom occurs prior to serious timber volume losses. Forest-wide a comparison of the number of attack centers was made for the past three years. These data are from aerial surveys and are quantitative in nature. They are as accurate as aerial surveyors can get; however, they do not represent a precise 100 percent count. Our purpose in presenting these data is to show the declining trend in beetle activity.

	Number Fader Groups	
Year	3 to 10 trees	>10 trees
1970	995	499
1971	581	195
1972	229	67

It should be remembered that visual fading occurs approximately one year after the new attacks so essentially when we are talking about this year's fader groups, we are looking at attacks that occurred in 1971. Barring uneventful natural happenings, tolerable levels of mortality should occur in the near future if the current trend continues.

Research entomologists are investigating several biological leads that may allow them to manipulate beetle populations effectively in integrated control techniques. Field tests on one such study were conducted on the Lowman and Idaho City Ranger Districts in 1972. Galen Trostle, R-4 Control Entomologist, and the Boise Zone Forest Pest Control staff established plots and collected field data for the MCH study being conducted by Malcolm Furniss, Research Entomologist in the Forestry Sciences Laboratory at Moscow. MCH (methyl-cyclohexenone) is a repellent substance derived from the female Douglas fir beetle which is thought to mask the female's attraction after mating. Purpose of the study was to determine the ability of MCH to protect susceptible Douglas firs from beetle attack. During the course of the study the material was diffused in controlled amounts and spacing around felled trees to simulate windthrow. Such trees are sources of beetle buildup. Some of these trees were left untreated; others were randomly treated with MCH. When all data are analyzed, an evaluation will be made to determine the effectiveness and desirability of MCH.

MOUNTAIN PINE BEETLE - Dendroctonus ponderosae Hopk.

Forest-wide the mountain pine beetle continues to cause losses in second growth ponderosa and mature lodgepole pine stands. Attack centers shift in location with depletion of stands as beetles seek out desirable host trees. The beetle overflight perimeter of the ongoing epidemic in the Cascade-Long Valley area entered National Forest lands in 1971 in the middle to upper Clear Creek drainage. In 1972, increased numbers of new faders were detected from the air. Ground evaluations showed new attacks on green trees, when an inspection was made in August with District foresters. Continuing surveillance will be kept on the area and ground evaluations made to keep land managers informed of damage to the stands.

We have followed mountain pine beetle activity for several years on the private lands southeast of Cascade. Infestations occur in second growth ponderosa pine and border forest lands on the north. To date, only light losses have been observed on forest lands in that area. This infestation has never received direct control action and therefore has provided an undisturbed area for evaluating the effect of beetle activity in second growth stands.

Attacks have continued for eight consecutive years at what can be considered epidemic status. Basically, mortality has been confined to small diameter, stagnated pines which in effect has produced a non-selective thinning. Data was obtained in 1972 in the same areas sampled last year by variable plot cruising north and south of Warner's Pond, Table 1.

Results of 30 variable plots (BAF 20) taken north of Warner's Pond showed that out of an original stocking of 281 ponderosa pines per acre in sizes larger than saplings, 172 have been killed by the mountain pine beetle. In addition to 109 ponderosa pines, residual stands contain 32 lodgepole and 8 Douglas fir or subalpine fir per acre in the same size classes. Current residual stands total 149 trees per acre of all species with a basal area of 99. Most of the large diameter lodgepole have been killed. Results of 30 variable plots (BAF 20) south of Warner's Pond showed out of the original stocking of 188 ponderosa pine trees per acre in size classes larger than saplings, 106 have been killed. In addition to 82 ponderosa pines, residual stands contain 39 lodgepole and 3 Douglas fir or subalpine fir per acre in the same size classes. Current residual stands total 124 trees per acre of all species with a basal area of 82. Most of the large diameter lodgepole have been killed.

It can be seen that losses continue to be heaviest in smaller diameter classes of ponderosa pine. It should be noted, however, that stocking of larger diameter trees is inversely proportionate to the number of smaller trees. Smaller diameter trees are still available for continuing attacks of the beetle in spite of high losses the past several years.

Data from the cruise plots proved to vary from plots taken in the same general areas last year. The 1972 cruise did not reflect the known trend of increased mortality in relation to the 1971 cruise. We plan to establish permanent plots in 1973 to determine the subsequent annual rate of beetle impact with greater precision. Ultimate data obtained, including the residual stocking remaining in the aftermath of the epidemic, should furnish useful information for management planning in similar stands on the forest that presently are uninfested.

About 500 lodgepole pines were killed by mountain pine beetle in 1971 along the North Fork of the Boise River in the Graham area. No formal cruise has ever been made of this infestation; however, aerial observations in 1972 indicated a marked downward trend in beetle activity.

ENGRAVER BEETLES - *Ips* spp.

Ips activity has increased in recent years. Scattered winter top breakage added to *Ips* population buildups in local areas. During the aerial survey faded groups were just becoming visible from second generation attacks. Nevertheless, a total of 26 fader groups was sketch mapped, mostly on the

Boise and Idaho City Ranger Districts. The largest group was arranged in a "shotgun" pattern that totalled about 600 faded trees located along Strawberry Creek. Several groups of 20 to 100 trees each were observed in upper Cottonwood Creek and Thorn Creek drainages. A 50-tree fader group occurred on Dry Buck Creek, and over 100 faders in two groups on the North Fork of Long Gulch. Many additional groups of faders appeared late in autumn from late generation beetles in the upper Thorn Creek and Cottonwood Creek drainages. Beetle populations increased to damaging numbers on the Trail Creek timber sale, Boise Ranger District, in late summer. The current situation and damage measurements are discussed in a separate evaluation report.

Usually late generation Ips do not cause much of a problem. However, the past two seasons weather factors favorable for Ips development were prevalent during July, August, and September. In those months weather patterns were characterized by low precipitation rates, low humidity and high air temperatures.

Ips populations usually cannot persist in standing trees without new slash or thinning debris available to supplement normal beetle numbers. A continuous supply of fresh slash in sufficient quantity to absorb emerging beetles should prevent standing tree attacks so long as operations do not stop. The key word is "continuous", for whenever slash becomes unavailable the last emerging beetles are likely to attack standing trees. Intermittent cutting should be avoided during hot dry weather. The last few weeks of cutting slash should be piled and burned.

WESTERN SPRUCE BUDWORM - Choristoneura occidentalis Free.

In 1972 most of the total acreage of budworm defoliation on the Boise N.F. was transferred to the Challis N.F. by administrative forest boundary realignment. The part of the Idaho Primitive Area that lies within the Boise N.F. in 1971 is now part of the Challis N.F. During the 1972 aerial detection survey, some 33,700 acres of budworm defoliation affecting Douglas fir, white fir and Engelmann spruce, were sketch mapped in this area. The insect conditions report for the Challis N.F. covered this budworm activity.

Budworm defoliation on the Boise, as stated in the 1971 report (1970 field activity) was the lowest recorded for the previous eight years. The 1971 survey, however, revealed an almost threefold increase from 5,800 acres (1970) to 17,200 acres, and defoliation intensity also showed a rise. These infestations, up to 1969, had been confined to portions of the Idaho Primitive Area. In 1971 two new defoliation centers were detected. One on Snowbank Mountain and the other along the North Fork of the Payette River in the vicinity of Big Eddy. The infestation near Big Eddy subsided and was not picked up in the 1972 aerial survey. The area at the base of the east side of Snowbank Mountain was mapped at 1,600 acres of light and 2,600 acres of moderate defoliation in 1972. At the present time, tree damage is not serious enough to warrant consideration for control.

WESTERN TUSSOCK MOTH - Orgyia vetusta (Hy. Edw.)

Populations of this insect caused moderate to heavy defoliation of Ceanothus velutinus Dougl. in 34 widely scattered locations on the Boise and Idaho City Ranger Districts and Bureau of Land Management lands. Five of the larger areas defoliated covered more than 600 acres each. Acreage and intensity of damage, however, was less than in 1971. Migration and damage to seedling ponderosa pines was not noted in those areas checked as happened in 1971.

Work priorities did not allow for formal evaluations of tussock moth activity. It appeared, however, that a native polyhedrosis virus caused sufficient larval mortality that significantly reduced populations. No observable damage to ponderosa pine plantations in the Town Creek plantation was noted.

PINE BUTTERFLY - Neophasia menapia (F. & F.)

The infestation trend appears to be increasing for the pine butterfly in old growth ponderosa pine stands. Many reports were received of adult butterfly activity in 1972. Egg mass surveys were conducted in September and October for predicting 1973 damage.

Entomologists in Region 1 have developed a computer model for analyzing pine butterfly egg-mass data. In cooperation with the Missoula office, we have submitted the Boise data to them for analysis. A separate biological evaluation report will be submitted to you in the near future covering the expected conditions for the summer of 1973.

TABLE 1. IMPACT OF MOUNTAIN PINE BEETLE ON SECOND GROWTH PONDEROSA PINE. ATTACKS HAVE BEEN OCCURRING UNCHECKED FOR EIGHT CONSECUTIVE YEARS.

Warner's Pond - North(1972). Summary

Dia. Class	Ponderosa Pine Live Stems/A	Ponderosa Pine Live % of Stand	Ponderosa Pine Dead Stems/A	Ponderosa Pine Dead % of Stand	% of DBH Class Lost To Date	Lodgepole Pine Live Stems/A	Lodgepole Pine Live % of Stand	Lodgepole Pine Dead Stems/A	Lodgepole Pine Dead % of Stand	Other Live Stems/A	Other Live % of Stand	Total Stems/A	Total % of Stand
6	37	11.4	88	27.0	(70)	14	4.3	-		7	2.1	146	44.8
8	31	9.5	52	16.0	(63)	12	3.7	4	1.2	-		99	30.4
10	12	3.7	21	6.5	(64)	4	1.2	-		1	.3	38	11.7
12	13	4.0	6	1.8		1	.3	1	.3	-		21	6.4
14	7	2.2	4	1.2		-		-		-		11	3.4
16	4	1.2	-	-		1	.3	-		-		5	1.5
16	5	1.5	1	.3		-		-		-		6	1.8
	109	33.5	172	52.8	(61)	32	9.8	5	1.5	8	2.4	326	

1:2.5 (New/Old Attack Ratio)

Table 1, continued.

Warner's Pond - South(1972) - Summary

Dia. Class	Ponderosa Pine Live Stems/A	Ponderosa Pine Live % of Stand	Ponderosa Pine Dead Stems/A	Ponderosa Pine Dead % of Stand	% of DBH Class Lost To Date	Lodgepole Pine Live Stems/A	Lodgepole Pine Live % of Stand	Lodgepole Pine Dead Stems/A	Lodgepole Pine Dead % of Stand	Other Live Stems/A	Other Live % of Stand	Total Stems/A	Total % of Stand
6	30	11.7	41	15.8	(58)	10	3.9	3	1.1	1		84	32.5
8	21	8.1	38	14.7	(64)	21	8.1	9	3.5	2	.8	91	35.2
10	11	4.2	19	7.3	(63)	7	2.7	11	4.2	-		48	18.4
12	7	2.7	6	2.3	(46)	-		2	.8	-		15	5.8
14	7	2.7	2	.8		1	.4	2	.8	1	.4	13	5.1
16	3	1.1	-			-		1	.4	-		4	1.5
16	3	1.1	-			-		1	.4	-		4	1.5
	82		106			39		29		3		259	
		31.6		40.9	(56)		15.1		11.2		1.2		(100)